CE5.h related: Information on the impact of the merge candidate list pruning process on side views encoding

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Abstract

HEVC implements a candidate vector list for merge and skip modes. The construction of this list is normatively specified. A simplification of the candidate list construction process has been proposed in JCTVC-G593. The impact of this simplification on the HEVC coding performance is negligible while decreasing the complexity. It has been adopted and is implemented in the HM 6.1, hence also in the current HTM 3. It is reported in this document that in the context of 3D video coding, the simplification of the candidate list construction has a non-negligible impact on the encoding performance of the side views (0.4% loss on average). The base view is unaffected, thus confirming that the simplification has a negligible impact on the HEVC coding performance.

1 Introduction

In JCTVC-G593 [1], a simplification of the merge candidate list construction process is proposed. More specifically, the complexity is decreased by reducing the number of necessary vector comparisons during the pruning of the candidate list. Moreover, it becomes possible to implement a shortcut in the decoder, by constructing the candidate vector list only up to the required index. The counterpart of this simplification is that the pruning of candidate vectors is not perfect anymore. A motion vector can be present several times in the list, thus impairing its efficiency. This phenomenon has a negligible impact on the HEVC coding performance though.

In the 3D video coding context, it has been observed that the impact of the pruning process simplification is non-negligible on the side views, as shown in Table 1.

2 Experimental results

The experiment has been conducted with HTM 3.0 and evaluation is based on common test conditions [2].

The simplified pruning process is deactivated by setting the macro SIMP_MRG_PRUN to 0 in the typedef.h file.

Results are provided in Table 1. It is clearly observed that the coding performance is almost unchanged on view 0. On the other hand 0.4 % is gained on side views on average by deactivating the simplified pruning process. A maximum of 1.1% gain is reported on PoznanHall2 view 1.

The HTM 3.0 has been modified in order to deactivate the simplified pruning process only on side views, thus keeping an HEVC compliant base view. Similar results are obtained, as shown in Table 2.

Table 1: Results obtained with HTM 3.0 and SIMP_MRG_PRUN set to 0, compared to HTM 3.0.

	video 0	video 1	video 2	video only	enc time
Balloons	0,0%	-0,6%	-0,7%	-0,3%	100,5%
Kendo	-0,1%	-0,4%	-0,7%	-0,3%	100,1%
Newspapercc	0,0%	-0,2%	-0,3%	-0,1%	97,7%
GhostTownFly	0,0%	0,0%	-0,1%	0,0%	103,5%
PoznanHall2	0,0%	-1,1%	-0,4%	-0,4%	100,4%
PoznanStreet	-0,1%	-0,2%	-0,3%	-0,2%	99,2%
UndoDancer	0,0%	-0,3%	-0,5%	-0,2%	103,0%
1024x768	0,0%	-0,4%	-0,6%	-0,3%	99,4%
1920x1088	0,0%	-0,4%	-0,3%	-0,2%	101,5%
average	**0,0%**	**-0,4%**	**-0,4%**	**-0,2%**	**100,6%**

Table 2: Results obtained with HTM 3.0 and SIMP_MRG_PRUN deactivated on views 1 and 2, compared to HTM 3.0.

	video 0	video 1	video 2	video only	enc time	dec time
Balloons	0,0%	-0,3%	-0,5%	-0,2%	100,5%	87,6%
Kendo	0,0%	-0,3%	-0,6%	-0,3%	100,5%	86,2%
Newspapercc	0,0%	-0,1%	-0,2%	-0,1%	99,3%	87,1%
GhostTownFly	0,0%	-0,1%	-0,3%	-0,1%	102,3%	92,8%
PoznanHall2	0,0%	-1,2%	-0,6%	-0,5%	104,0%	92,3%
PoznanStreet	0,0%	-0,3%	-0,3%	-0,1%	98,7%	90,8%
UndoDancer	0,0%	-0,2%	-0,4%	-0,1%	103,9%	91,1%
1024x768	0,0%	-0,3%	-0,4%	-0,2%	100,1%	87,0%
1920x1088	0,0%	-0,4%	-0,4%	-0,2%	102,2%	91,8%
average	**0,0%**	**-0,4%**	**-0,4%**	**-0,2%**	**101,3%**	**89,7%**

3 Conclusion

The pruning process simplification process proposed in [1] has a non-negligible impact on side views encoding in the HTM 3.0. Therefore, it may be suggested to deactivate or modify this feature on side views.

4 References

[1] Oguz Bici, Jani Lainema, Kemal Ugur, « Non-CE13: Simplification of merge mode », JCTVC-G593, JCT-VC 7th Meeting, Geneva, CH, 21-30 November 2011.

[2] Heiko Schwarz, Dmytro Rusanovskyy, « Common test conditions for 3DV experimentation », ISO/IEC JTC1/SC29/WG11 MPEG2011/N12745, May 2012, Geneva, Switzerland.

5 Patent rights declaration(s)

INRIA does not have any current or pending patent rights relating to the technology described in this contribution.